

CLAIMS

1. An olefin polymerization process comprising contacting ethylene alone or with one or more olefinically unsaturated comonomers under suitable polymerization conditions with a Group 3-6 metallocene catalyst compound comprising a π -bonded ring having one or more C_3 or greater hydrocarbyl, hydrocarbylsilyl or hydrocarbylgermyl substituent said substituent bonded to the ring through a primary carbon atom and, where the compound contains two π -bonded rings, the total number of substituents on the rings is equal to a number from 3 to 10, said rings being asymmetrically substituted where the number of substituents is 3 or 4.

2. The process of claim 1 wherein said catalyst compound comprises a π -bonded ring having one of said C_3 or greater hydrocarbyl, hydrocarbylsilyl or hydrocarbylgermyl substituents.

3. The process of claim 2 wherein said metallocene compound contains two π -bonded rings not covalently bridged to each other and said rings have four or five methyl groups on the first ring and a C_3 or greater hydrocarbyl, hydrocarbylsilyl or hydrocarbylgermyl substituent on the second ring.

4. The process of claim 1 wherein said metallocene compound contains two π -bonded rings covalently bridged to each other and said C_3 or greater hydrocarbyl, hydrocarbylsilyl or hydrocarbylgermyl substituent is attached at the 3 or 4 position on one of the rings, where the ring carbon covalently bound to the bridge is counted as the 1 position.

5. The process of claim 3 wherein the first of the two rings has four methyl groups.

6. The process of claim 5 wherein the second of the two rings C_3 or greater substituent.

7. A process according to claim 1 wherein the contacting is done under gas phase conditions.

8. A process according to claim 1 wherein the contacting is done under slurry conditions.

5 9. An ethylene homopolymer or copolymer having an MIR ≤ 35 , a MWD = 2-15, a CDBI ≥ 60 , and a melt strength $\geq 6.0 - 6.0 \times \log(MI)$.

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10 10. The homopolymer or copolymer of claim 9 wherein the melt strength is $\geq 8.0 - 6.0 \times \log(MI)$.

11. The polymer of claim 9 where the MI is 0.3 to 1.2.

12. The polymer of claim 9 where the MIR is \leq than 25.

15 13. The polymer of claim 9 consisting of ethylene.

14. The polymer of claim 9 comprising ethylene and one or more C₃-C₈ α -olefin.

20 15. The polymer of claim 11 consisting of ethylene.

16. The polymer of claim 11 comprising ethylene and one or more C₃-C₈ α -olefin.

17. The polymer of claim 12 consisting of ethylene.

25 18. The polymer of claim 12 comprising ethylene and one or more C₃-C₈ α -olefin.

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